

# Prof. Tohru Asai & Prof. Taweesak Chotivatanapong: treatment of mitral valve disease

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## Introduction

During the 24<sup>th</sup> Annual Meeting of Asian Society for Cardiovascular and Thoracic Surgery (ASCVTS) in conjunction with 9<sup>th</sup> AATS/ASCVTS Postgraduate Course and 4<sup>th</sup> Asian Single Port VATS Symposium, Prof. Tohru Asai and Prof. Taweesak Chotivatanapong presented important lectures on the experience with transcatheter aortic valve implantation (TAVI)/transcatheter aortic valve replacement (TAVR).

Dr. Tohru Asai is Professor and Chairman of the Department of Surgery, Shiga University of Medical Science, Otsu, Japan. The department has one of the largest cardiovascular practices for advanced heart and vascular disease in Japan. He was a pioneer surgeon performing total arterial multi-vessel off-pump coronary artery bypass (first in 1996), developed the ultrasonic skeletonization harvesting method for the gastroepiploic artery grafts (in 2001), invented the “butterfly resection technique” for degenerative mitral valve repair (in 2006), and innovated the “extended sandwich patch” method for post infarction VSD repair. He is also been known as an expert in technically-demanding aortic arch surgery, total aortic arch replacement with a branched prosthetic grafts under mild hypothermia. Dr. Tohru Asai serves on several editorial boards, and he is a board director of ISMICS. International cooperative activities include regular visits to Cho Ray Hospital (Ho Chi Minh City, Vietnam), surgical live demonstrations in Malaysia, educational lectures in the US, Spain, Italy, Croatia, China, Korea, India, Thailand, and Argentina. National and international cardiac surgeons frequently view his high-quality surgical videos at his web site, <http://www.youtube.com/user/asaitoru>.

Dr. Taweesak Chotivatanapong is Chairman of International Academic Institute Program of central Chest Institute of Thailand, Nonthaburi, Thailand. He received his B.Sc from the Faculty of Medical Science, Mahidol University Bangkok, Thailand, is a fellow of the Royal College of Surgeons of Thailand (FRCST) and holds a Master of Management, SASIN Institute

of Business Administration, Chulalongkorn University, Bangkok, Thailand. Dr. Taweesak is a world-renowned cardio-thoracic surgeon, familiar with standard and novel technique of mitral valve repair.

We had an honor to invite Prof. Asai and Prof. Taweesak to do a brief, joint interview on the treatment of mitral valve disease.

## Interview

**CDT:** *What is the current management and future challenges of mitral valve disease?*

**Prof. Asai:** The situation is increasingly complex, because non-surgical options treatment options are becoming available in interventional cardiology. We have good outcomes from conventional surgery, while there are still some challenges. Because patients with mitral valve disease have different disease characteristics, we have to develop principles and guidelines to help judge which patient should undergo a specific procedure and to ensure good short and long-term outcome.

**Prof. Taweesak:** The challenges of mitral valve disease are real; rheumatic heart disease remains a problem worldwide and we need to find better ways to both prevent development and treat patients with existing rheumatic heart disease. The other issue is to treat the elder patients with degenerative mitral valve disease, which is increasing with older populations’ worldwide. Surgery in older patients is complicated by often multiple comorbidities, which have to be addressed at the same time. For these patient populations, catheter based and minimally invasive approaches are increasingly important.

**CDT:** *Could you give brief introduction of the butterfly technique? What are the indications for the butterfly technique?*

**Prof. Asai:** The butterfly technique is one way to fix the

mitral valve properly. The unique of the mitral valve is complex. We should be aware of what shape the valve has to be to get a long good outcome without complications. The aim of butterfly resection is to optimize the geometry of resultant new leaflet, with controlled height reduction of the prolapsing segment, but without annular reduction (1).

The mitral valve in patients with degenerative disease typically has a lot excess tissue, but different patients have different characteristics. A particular focus of the butterfly techniques to control the height of the leaflet without annular plication or compression.

**Prof. Taweesak:** That is an interesting topic to discuss. The butterfly technique has been described elegantly by Prof. Asai. The technique has been based on similar concept of Dr. Patrick Perier and that is why we do the preservation of tissue, because we understand that tissue is very important and the coaptation is one of the most important goal we have to achieve good long term results. Now, we resect only the excess part necessary to achieve the exact high without disturbing the annular diameter. Actually, my approach is very similar, but I called it “double wedge”. The key is that we need to do only what is necessary to achieve maximum tissue with the least interference of the mitral annulus. Once we achieve this, we can achieve good mitral valve repair. And I think that is why Prof. Asai likes to explain this technique in a systematic way to all surgeons to follow. The name butterfly repair is good, because it intuitively describes the shape of the valve after the repair.

**Prof. Asai:** In conclusion, before the surgery, the surgeon must have an idea how the mitral valve should be shaped. I recommend the butterfly technique when the leaflet or the excess tissue is larger/higher than 15 millimeter. We do not use butterfly technique when the leaflet is very short. So the butterfly technique is not a good choice for every patient, but it is a very useful technique for certain patients. Whether the technique is called butterfly or not is not important. The important thing is you should be aware of the high of leaflet and how we can avoid serious complications, including systolic anterior motion (SAM).

***CDT: What are the challenges of the minima resection approach for complex mitral valve repair?***

**Prof. Asai:** The minimal resection approach is a trend for the society and among surgeons. Previously, we would cut more tissue, which was not necessary. The minimal resection approach changes a lot things in mitral valve

repair. Due to the complexity of the mitral leaflets, no matter what technique you use, you must follow a certain goal of mitral valve morphology.

**Prof. Taweesak:** I want to point out that the minimal resection approach is a very good operation, which has been proven to ensure a good long term result. This is a benchmark. However, sometimes the resection of leaflets cannot solve the problem for the old patients. Therefore, surgeons and interventional cardiologists started to look for other approaches or techniques to solve the problem, and there are more and more available techniques now. The challenge becomes how to choose the most suitable techniques for various patients.

**Prof. Asai:** Yes, and we have more precise pre-operative assessment by sophisticated echocardiography, specially three-dimensional echocardiography, and also other imaging modalities,. I think we will see more repair techniques in the future.

***CDT: Is valve repair preferable to valve replacement in mitral valve disease?***

**Prof. Asai:** The mitral valve is interesting and complex. It plays an important role in the contraction of left ventricle. Simply changing of the valve cannot maintain the contractile function. Due to this, I think it is much better to repair the mitral valve than to replace it. Yet, when we talk about the mitral valve, we must talk about the ventricular function or how the heart works after valve repair or replacement. So we still need more evidences to proof which one is better.

**Prof. Taweesak:** After five decades of researches, valve repair is proven to be better than valve replacement in terms of left ventricular function, quality of life, complications, and long term survival. Above are the things we know, yet there are still many things of mitral valve which we don't know. Based on the current evidence, yes, the valve repair is better.

However, there remains debate in certain populations, e.g. in patients with functional MR. In these populations, more research is needed to prove whether mitral valve repair is better than mitral valve replacement.

***CDT: Thank you so much.***

For more details about this interview, please refer to the following video (*Figure 1*).



**Figure 1** Prof. Tohru Asai & Prof. Taweesak Chotivatanapong: treatment of mitral valve disease (2).

Available online: <http://www.asvide.com/articles/1631>

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### Footnote

*Conflicts of Interest:* The author has no conflicts of interest to declare.

### References

1. Asai T. The butterfly technique. *Ann Cardiothorac Surg* 2015;4:370-5.
2. Zhou SL. Prof. Tohru Asai & Prof. Taweesak Chotivatanapong: treatment of mitral valve disease. *Asvide* 2017;4:319. Available online: <http://www.asvide.com/articles/1631>

(Science Editor: Silvia L. Zhou, CDT, [editor@thecdt.org](mailto:editor@thecdt.org))